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FACT SHEET

L-964

KEYS TO PROFITABLE POTATO PRODUCTION

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The crop value of Irish potatoes in Texas exceeded $15 million in 1969 from 27,200 acres. Irish potatoes accounted for 9.4 percent of the acreage and 12.5 percent of the value of the 1969 Texas vegetable industry. The annual value of the Texas potato crop usually is surpassed only by onions and carrots.

Areas of Production

Although potatoes are grown over the entire state, most of the commercial production is located in three areas: the Rio Grande Valley, the Upper Coast-Winter Garden and the Munday-High Plains areas.

Planting begins in the lower Rio Grande Valley in late December, and continues into early February. In the Upper Coast-Winter Garden and Munday areas, planting usually begins in mid-February and continues through March. Mid-March through April is the principal planting time in North Texas, with scattered plantings for late harvest occurring in July and early August.

Harvesting begins in April in the Rio Grande Valley. Supplies are available from the Winter Garden area in late April and early May, with potatoes available from the San Antonio-Upper Coast region about the middle of May. Digging begins in the Munday area in early June, with peak movement from the High Plains area in July and August. Supplies continue into late fall.

Seasonal Movements

Peak movement of Texas potatoes to market occurs from mid-June through the first half of August. About 70 percent of the Texas production is marketed during this period, with a major portion in the High Plains area near Hereford.

Climatic Requirements

Potatoes produce highest yields when grown under fairly cool temperatures and with ample moisture. Daytime temperatures of 70 to 75 degrees followed by cooler night temperatures are ideal for maximum yields. These conditions are most critical during the early part of the growing season when the tubers are forming. High temperatures or insufficient moisture during this period will result in poor yields. Yields are consistently higher in North Texas than in South Texas primarily because of cooler day and night temperatures during the tuber set period.

Water requirements vary according to soil types and climatic conditions, but usually average from 16 to 22 inches.

Soil Types

Potatoes are adapted to most Texas soils, provided they are well-drained. Heavy clay soils should be avoided unless a high organic matter content is maintained. If possible, soils which blow or have poor water-holding capacity should be avoided. Proper fertilization and irrigation practices often can produce good yields on undesirable soils.

Fertilizers

The fertility level of the soil greatly influences fertilizer requirements. Potato plants require ample fertilizer to insure steady growth and tuber formation. Nutrient requirements occur early in the growth of the plant, which necessitates the application of fertilizer at or just before planting. The fertilizer should be banded 2 inches to the side and 1 inch below on both sides of the seed piece. Deeper applications of fertilizer are beneficial when moisture is limited.

Fertilizer rates vary with soil types, climatic conditions and fertility levels of the soil. About 100 pounds of nitrogen and an equal amount of phosphorus are required for good potato yields in most areas of Texas. Soils in most potato producing areas of Texas contain enough potassium to produce good yields, although a complete fertilizer is required in East Texas. For a more reliable estimate of the fertilizer requirments, refer to soil test results.

Varieties

A number of potato varieties are grown in Texas. Red La Soda, Pontiac, and Norland are the principal red-skinned varieties. White potato

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varieties include Kennebec, Cherokee and Norgold Russet. Russet Burbank is produced in Gaines County in Northwest Texas only as a fall crop, but is not adapted for spring production in Texas.

A considerable portion of the Texas potato acreage is produced for the chip industry, with Kennebec grown primarily for this purpose.

New varieties worthy of trial in Texas are the white-skinned varieties Alamo, Superior and Shurchip.

Disease resistance, size, color, unformity, earliness and yield are of prime importance in variety selection.

Many potato varieties have blooms which, when pollinated, often set fruit. This potato fruit or "seed ball" produces the true seed of the potato. It resembles a small green tomato, and is seldom larger than about 1 inch in diameter. Some gardeners believe this potato fruit is a cross between potatoes and tomatoes, but it is not.

Seeding Rates

The amount of seed required to plant an acre varies with plant spacing and size of the seed piece. Usually it takes 1,000 to 1,800 pounds of seed pieces per acre. Potatoes usually are planted in rows 36 inches apart, with an in-the-row spacing of 8 to 12 inches. Closer spacing in fertile land has proved beneficial in some areas. Use seed pieces treated with Polyram, 1 pound per 100 pounds of seed weighing 1½ to 2 ounces and having more than one eye. B-size potatoes often are used as seed-pieces to eliminate the cost of cutting larger potatoes, and to lessen the chance of spreading infectious diseases during the cutting operation. Normally, a better stand results from using whole potatoes.

Use only certified, disease-free seed potatoes for commercial plantings.

Land Preparation and Planting

The land should be deep plowed and then disk harrowed just before planting. On some fields, it may be necessary to finish the land with a spike-toothed harrow to break clods and level the land. Proper leveling of land is essential before final preparation of the seedbed.

Plant early potatoes 3 to 4 weeks before the frost-free date at a depth of 2 to 3 inches, measured from the top of the seed piece to the bed level. Increased yields and higher prices warrant the risk of frost damage by early planting. Ridging is practiced in many areas of Texas. This involves throwing soil to the plants during early cultivations so that about 6 inches of soil cover the seed piece when tuber formation occurs.

Irrigation

The most common method of watering potatoes in Texas is by furrow irrigation, although sprinkler systems are becoming popular in many areas. Adequate soil moisture at planting time is preferred. If soil moisture is limited, a common practice is to irrigate the crop up. Avoid wetting the top of the bed to prevent seed piece decay.

Irrigations needed during the growing season may vary from three to six. Generally, the first irrigation should be applied when the plants appear to need moisture to maintain vigorous growth. Thus the soil should be kept uniformly moist until the tubers have reached full size. Moisture stress, followed by irrigation or rainfall, often results in secondary growth and misshapen tubers. Conversely, excess soil moisture will reduce yields and quality.

Cultivation

By the time the plants bloom fully and begin to form tubers, beds or ridges in which potatoes form should be completed and crop cultivation should cease.

Weed Control

Weeds emerging after the last cultivation often are a serious problem because they reduce the efficiency of mechanical harvesting.

Many annual weeds and grasses can be controlled by applying recommended herbicides before planting or during the early growth stages. Treflan, applied at the rate of 1½ to 2 pints per acre, incorporated 1½ to 2 inches deep, gives satisfactory control of most annual weeds and grasses. Preemerge applications of Dacthal, at the rate of 6 to 10 pounds per acre, result in satisfactory control of many annual weeds. Where nutgrass is a problem, preplant or post-emerge applied Eptam at 3 to 5 pounds per acre is suggested. Eptam must be incorporated mechanically or diluted in overhead irrigation water. Dacthal, Treflan and Eptam can be applied at lay-by or during the last cultivation.

Diseases and Insects

Potatoes are subject to various diseases during the growing season. Use preventive practices, rather than control measures.

Early and late blight can be prevented by regular applications of a Maneb fungicide at 7 to 10-day intervals. Resistant varieties, crop rotation and sanitation practices should be utilized to prevent diseases such as scab, rhizoctonia, southern blight and other diseases. For control recommendations, see MP-902, *Texas Guide For Reducing Vegetable Disease Losses.*

Wireworms, leafhoppers, Colorado potato beetles, psyllids and white grubs are the most common insect pests of potatoes. Dyfonate, applied at the rate of 40 pounds of 10 percent granules per acre at planting, provides control of wireworms, grubs and other soil-borne insects. An application of DiSyston at the rate of 2 pounds actual per acre, banded at planting, provides early season control of leafhoppers, psyllids, aphids and flea beetles. Colorado potato beetles, blister beetles and hornworms can be controlled with 1½ to 2 pounds per acre of Sevin. Parathion often is used at the rate of 0.25 to 0.50 pounds per acre to control aphids, psyllids, cucumber beetles and flea beetles. Apply all insecticides according to label directions and exercise caution.

Harvesting

Although harvest time depends primarily on maturity of the crop, other factors, such as weather conditions, market prospects and the labor situation, usually play a more important role with Texas growers. Growers should harvest potatoes only when they are mature as indicated by good size and skin-set.

To insure good skin-set, the plants should mature and die before harvest. Often it becomes necessary to kill the plants before harvesting. In Texas, vine beaters often are used to destroy the vines. One to 2 gallons of Sinox plus 3 to 5 gallons of diesel oil in 50 gallons of water per acre applied 12 to 15 days before harvest may be used. (Avoid drift on adjacent crops.) Take care in selecting vine killers, since tuber discoloration may occur.

Most of the potatoes grown in Texas are harvested mechanically with simple two-row potato diggers. Some machines are elaborate devices which permit workers to grade and bag the potatoes, while other machines load the potatoes in bulk into field trucks. Most fresh market potatoes are mechanically dug, hand-placed in field bags and hauled to sheds. The potatoes are washed, sized and graded, and usually placed in 50 or 100-pound burlap bags for shipment. Cardboard cartons holding 50 pounds of potatoes are becoming popular in some areas for premium grade potatoes. Graded sizes are No. 1, No. 2, B's and creamers.

Marketing

Texas potatoes normally are sold on the open market at prevailing prices. Potatoes for chipping usually are sold at contract prices per hundredweight, and may be graded or ungraded.

Table 1. Estimated cost and return per acre of Texas potatoes—1970

		No. of Units and Value	Cost or Value	
1.	Production receipts	186 cwt. @ $3.25*		$594.50
2.	Cash expenses			
	Tractor and equipment	15 hr. @ .80	$ 12.00	
	Tractor labor	17 hr. @ 1.50	25.00	
	Other labor	15 hr. @ 1.40	21.00	
	Seed (includes treatment @ .10/cwt., load and haul to field)	15 @ 4.90	73.50	
	Fertilizer (100-100-0)	200 lb. @ .11	22.00	
	Herbicides			
	Dacthal	4 lb.		
	Treflan	1½ pt.	10.10	
	Insecticides			
	DiSyston	20 lb. @ .23	4.60	
	Other	3 app. @ 2.50	7.50	
	Fungicide	5 app. @ 4.00	20.00	
	Irrigation water	6 app. @ 2.00	12.00	
	Vine killing	1 app. @ 4.00	4.00	
			$212.20	
	Interest on operating capital @ 8% for 6 mo.		8.49	
	Total			220.69
3.	Land expenses			
	Taxes		2.00	
	Interest on land investment (6%-$400/acre for 6 mo.)		12.00	14.00
4.	Overhead			25.00
5.	Harvest and marketing expenses			
	Harvesting and hauling	186 cwt. @ .40	74.40	
	Packing and grading (includes sack)	186 cwt. @ .76	141.36	
	Selling	186 cwt. @ 10% f.o.b.	59.45	
	Total		$275.21	275.21
6.	Total expenses			534.90
7.	Return to management			59.60

*Reference (3 or 5 year yield and price)

Cost and Returns

See Table 1 for estimated costs and returns of Texas potatoes on a per acre basis.

Cash expense, land and overhead cost estimates total $259.69 per acre. The figures represent a state-wide average, but may vary by area and season.

Table 2 indicates the cost of poducing and marketing potatoes per 100-pound sack. Harvesting and marketing costs per acre vary with yield. With higher yield, the production cost per sack decreases while harvesting and marketing costs per sack remain the same. Selling costs generally average 10 percent of the f.o.b. price received.

Figure 1 shows the relationship of the f.o.b. cost per bag of Texas potatoes to the yield per acre. The dotted lines in Figure 2 show that a yield of 200 hundredweight per acre requires an f.o.b. price of $2.78 per bag to break even. A lower yield of 100 hundredweight per acre would require a higher f.o.b. price of $4.08 per hundredweight to break even. The curve in figure 2 can be used by individuals to estimate potential returns based on expected yield or price.

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Table 2. Cost of producing and marketing a 100-pound sack of Texas potatoes as influence by marketable yield per acre.

Yield cwt/acre	Cost per 100-pound bag: Production	Harvesting* packing, selling	Total f.o.b. cost
75	$3.46	$1.48	$4.94
100	2.60	1.48	4.08
125	2.08	1.48	3.56
150	1.73	1.48	3.21
175	1.48	1.48	2.96
200	1.30	1.48	2.78
225	1.15	1.48	2.63
250	1.04	1.48	2.52

*Based on cost estimates shown in Table 1.

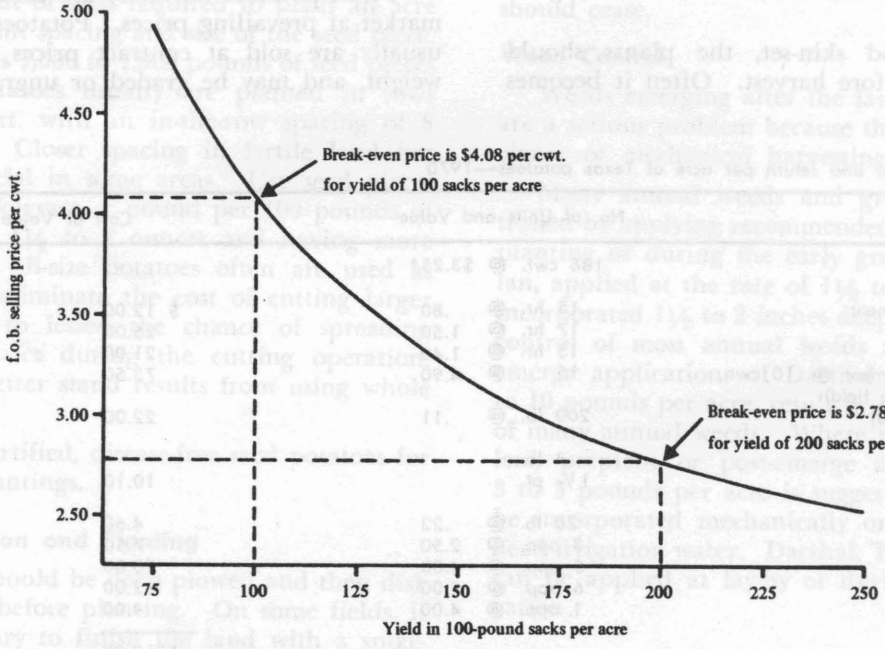

Fig. 1. Price of potato, f.o.b. per hundredweight required to break even at given yields. (Based on cost figures in Table 1).

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